SECTION 09 67 23
RESINOUS FLOORING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies a seamless flooring system with integral base.

B. Flooring consists of epoxy resin, aggregate, and finish coats for non-slip finish.

C. Section includes the removal of existing flooring, prep floor as required, and install new flooring.

1.2 RELATED WORK

Color and room finish schedule: see drawings

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Description of product to be provided; technical data showing compliance with specifications.
2. Application and installation instructions, including proposed deviations from specifications.

C. Samples:

1. Each color specified in Section 09 06 00, SCHEDULE FOR FINISHES.
2. Sample 300 mm (12-inch) square in each finish specified.
3. Sample showing construction from substrate to finish surface in thickness specified.

D. Certification and Approval:

1. Manufacturer's certification of material compliance.
2. Manufacturer's approval of installers.
3. Contractor's certificate of compliance with Quality Assurance requirements.

E. Warranty: Manufacturers warranty of materials and installation.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility:

1. Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer.
2. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

B. Installer trained and approved by manufacturer of primary material and having completed at least ten projects of similar size and complexity.

C. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Apply full-thickness mockups on 48-inch- (1200-mm-) square floor area selected by Resident Engineer.
   a. Include 48-inch (1200-mm) length of integral cove base.

D. Pre-Installation Conference

1. Arrange a meeting not less than thirty days prior to starting work.
2. Attendance
   a. Contractor
   b. Resident Engineer
   c. Manufacturer and Installer's Representative

1.5 MATERIAL PACKAGING DELIVERY AND STORAGE

A. Deliver materials to the site in original sealed packages or containers, clearly marked with the manufacturer's name or brand, type and color, production run number and date of manufacture.

B. Protect materials from damage and contamination in storage.

C. Maintain temperature of storage area between 15°C and 32°C (60° and 90°F).

D. Package materials in factory pre-weighed and in single, easy to manage batches sized for ease of handling and mixing proportions from entire package or packages.

1.6 WARRANTY

A. Work subject to the terms of the Article "Warranty of Construction" FAR clause 52.246-21.

B. Extend warranty period to three years.

1.7 APPLICABLE PUBLICATIONS

A. The publication listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

C267-01 (R2006).....Chemical Resistance of Mortars, Grouts, and Monolithic Surfacings

C413-01 (R2006).....Absorption of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacings, and Polymer Concretes

C580-02 (R2008).....Flexural Strength and Modulus of Elasticity of Chemical Resistant Mortars, Grouts, Monolithic Surfacings and Polymer Concretes

C722-04.....Chemical-Resistant Resin Monolithic Surfacing
C811-98 (R2008).....Surface Preparation of Concrete for Application of Chemical-Resistant Resin Monolithic Surfacings
C882/C882M-05e1.....Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear
D2047-97 (2008).....Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine

C. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 500-06.....Metal Finishes Manual

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Epoxy resinous flooring includes concrete epoxy primer, colored quartz aggregate epoxy resin mortar, clear epoxy sealer coat, and finish coat for non-slip finish.
B. System resistant to chemicals and abrasion.
C. Basis of Design:
1. Stonhard, Inc.; Stontec TRF® or approved products of equal salient physical, functional, and performance characteristics.

D. System Characteristics:
1. Color and Pattern: Select from manufactures standards
2. Wearing Surface: Standard
3. Integral Cove Base: 4"
4. Overall System Thickness: Nominal 3/16", 5mm.
5. Physical Properties of flooring system when tested as follows:

Property	Test	Value
Tensile Strength	ASTM D638	1,000 psi
Flexural Strength	ASTM C580	2,000 psi
Water Absorption	ASTM C413	0.056%
Coefficient of friction dry/slip index wet	ASTM D2047	>.79 dry >.65 wet
Impact Resistance	ASTM D4226	> 160 in. lbs
Abrasion Resistance	ASTM D4060 CS-17	<0.03 gm max
Thermal Coefficient of Linear Expansion	ASTM C531	12 x 10^{-6} in/in °F
Hardness Shore D	ASTM D2240	Between 70-90

E. System Components: Manufacturer's standard components that are compatible with each other and as follows:

1. Primer:
   a. Material Basis: Stonhard Urethane Primer.
   b. Resin: Urethane.
   c. Formulation Description: (2) two component, low viscosity, urethane.
   d. Application Method: Squeegee and nap roller.
   e. Number of Coats: (1) one.
2. Body Coat(s):
   a. Material Basis: Stonclad UR
   b. Resin: Urethane 100% solids.
   c. Formulation Description: 4 components.
   d. Application Method: Screed and Metal trowel.
      1) Thickness of Coats: 1/8"/ 3mm, with primer coat
      2) Number of Coats: One.
3. Under coat: Bonding coat for vinyl flake broadcast.
   a. Material Basis: Stontec epoxy undercoat.
   b. Resin: Epoxy
   c. Formulation Description: 100% solids.
   d. Type: Pigmented.
   e. Number of Coats: one
4. Broadcast: Vinyl Flake.
   a. Material Basis: Stontec Flake
   b. Formulation Description: Decorative flake for broadcasting.
   c. Type: Tweed (chips to be mixed in Mfg. facility)
   d. Finish: standard.
   e. Number of Coats: one.
5. Topcoat:
   a. Material Basis: Stontec UTF sealer.
   b. Resin: Aliphatic polyaspartic.
   c. Formulation Description: Two-component, UV resistant
   d. Type: Clear.
   e. Finish: Gloss.
   f. Number of Coats: two

Note: Components listed above are the basis of design intent; all bids will be compared to this standard including resin chemistry, color, wearing surface, thickness, and installation procedures, including number of coats. Contractor shall be required to comply with all the requirements

of the Specifications and all of the components required by the Specifications, whether or not such products are specifically listed above.

2.2 ACCESSORY MATERIALS

A. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated. No Single component or cementitious materials.

B. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Mechanically prepare substrates as follows:
   a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
   b. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.
2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
3. Verify that concrete substrates are dry.
   a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 75 percent.
   b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 7 lb of water/1000 sq. ft. of slab in 24 hours.
   c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.
4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions. Resinous materials only.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations

F. Maintain temperature of materials above 21°C (70 degrees F), for 48 hours before installation.

G. Maintain temperature of rooms where work occurs, between 21°C and 32°C (70°F and 90°F) for at least 48 hours, before, during, and 24 hours after installation. Maintain temperature at least 21°C (70 degrees F) thereafter.

H. Do not install materials until building is permanently enclosed and wet construction is complete, dry, and cured.

I. Concrete substrate cured and not less than 30 days old.

J. Area free of other trades during and for a period of 24 hours after installation.

3.2 INSTALLATION REQUIREMENTS

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations

    a. Apply joint sealant to comply with manufacturer's written recommendations.

B. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

C. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and top coating of cove base. Round internal and external corners. Refer to detail drawings.

D. Mix and apply mortar base as indicated for flooring system and at coverage rates recommended in writing by manufacturer. Screed mortar

materials, compact and smooth mortar base with steel finishing trowels.

E. Apply undercoat bonding for broadcast flakes. squeegee in thickness indicated for flooring system. Back roll liquids with finish rollers.

F. Broadcasts: Vinyl chip, in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer

G. Apply topcoat(s) in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.3 TERMINATIONS

A. Chase edges to "lock" the coating system into the concrete substrate along lines of termination.

B. Penetration Treatment: Lap and seal coating onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

C. Trenches: Continue coating system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.

D. Treat floor drains by chasing the coating to lock in place at point of termination.

3.4 JOINTS AND CRACKS

A. Treat control joints to bridge potential cracks and to maintain monolithic protection.

B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

A. The respective manufacturer's instructions for application and installation will be considered for use when approved by the Resident Engineer.

B. Submit proposed installation deviation from this specification to the Resident Engineer indicating the differences in the method of installation.

3.5 CURING, PROTECTION AND CLEANING

A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process.

B. Close area of application for a minimum of 24 hours.

C. Protect resinous flooring materials from damage and wear during construction operation.

1. Cover flooring with kraft paper.
2. Covers paper with 6 mm (1/4 inch) thick hardboard, plywood, or particle board where area is in foot or vehicle traffic pattern, rolling or fixed scaffolding and overhead work occurs.

D. Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

3.6 TOLERANCE

A. From line of plane: Maximum 3 mm (1/8 inch) in total distance of flooring and base.

B. From radius of cove: Maximum of 3 mm (1/8 inch) plus or 1.6 mm (1/16-inch) minus.

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